Mark D. Borges

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Research Experience:

UNIVERSITY OF COLORADO, Boulder, CO.
Cooperative Institute for Research in the Environmental Sciences (CIRES).
Research Associate. Developed time-dependent adjoint model. Implemented iterative technique for solution of eigen and optimization problems given an arbitrary time-dependent model and its adjoint. Extensive UNIX workstation experience. Enhanced the software developed at theUniversity of Washington for analysis of global model data sets, including an interactive graphical interface using the X11 Window System and NCAR Graphics 3.2. April 1992 – present.

UNIVERSITY OF WASHINGTON, Seattle, WA.
Research Assistant / Doctoral student.
Title of Dissertation: The Growth of Disturbances in Barotropic Models of the Atmosphere.
Chairperson of the Supervisory Committee: Professor D. L. Hartmann
September 1984 – March 1992.

WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, MA.
Summer Student Fellow. Analyzed absolute velocity observations obtained during the 1982/83 El Niño from the R.V. *Conrad* dropsonde data and compared to theory and previously obtained data sets. Presented results in seminar and technical report. Summer 1983.

CALIFORNIA STATE AIR RESOURCES BOARD, Sacramento, CA.
Student Assistant. Designed computer programs for analysis and compilation of upper tropospheric climatological data used for air quality and pollution control. February 1982–June 1983.

Education:

UNIVERSITY OF WASHINGTON, Seattle WA.
Ph.D. Atmospheric Science, March 1992.

UNIVERSITY OF CALIFORNIA, Davis CA.
B.S. Atmospheric Science, June 1983.
Coursework included atmospheric dynamics, physical oceanography, numerical analysis and statistics. Cumulative GPA = 3.86 on 4.00 scale. Graduated with Highest Honors. Departmental Citation. (annual award for superior achievement and scholarship). Deans' Honors List.

Publications:

Borges, M. D. and P. D. Sardeshmukh, 1997: Application of perturbation theory to the stability analysis of realistic atmospheric flows. *Tellus*, **to appear**.

Sardeshmukh, P. D., M. Newman and M. D. Borges, 1997: Free Rossby wave dynamics of the wintertime low-frequency flow. *J. Atmos. Sci.*, **54**, 5-23**.**.

Borges, M. D. and P. D. Sardeshmukh, 1994: Barotropic Rossby wave dynamics of zonally varying upper level flows during northern winter. *J. Atmos. Sci.*, **52**, 3779-3796**.**

Borges, M. D. and D. L. Hartmann, 1992: Barotropic instability and optimal perturbations of observed nonzonal flows. *J. Atmos. Sci.*, **49**, 335–354.

Toole, J.M. and M. D. Borges, 1984: Observations of horizontal velocities and vertical displacements in the equatorial Pacific Ocean associated with the early stages of the 1982/83 El Niño. *J. Phys. Oceanogr.*, **14**, 948-959.